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DDI-1163-74

18 April 1974

MEMORANDUM FOR: Director of Central Intelligence

FROM : Deputy Director for Intelligence

SUBJECT : Soviet Economic and Technological
Benefits from Detente

1. Last week you sent me a memo relaying some criticism of the OER paper on the Soviet economic and technical benefits flowing from detente. The criticism was that the paper was unduly soporific in its impact on possible US efforts to restrain the leakage of military-related technology. Your memorandum concludes with an injunction that our evaluations of foreign situations should give special attention to how they might impact on the US, in order to increase their relevancy to our decision-making processes.

2. In my view the paper accomplished two objectives with respect to relevancy to our decision-making processes. First, it concluded that the overall effects on Soviet economic growth resulting from detente-generated US-Soviet trade will be small. A corollary of this conclusion is directly related to US decision-making: The Soviet economic motivation for increased trade with the US is not so great as to induce the Soviets to make important concessions in political and military negotiations. OER and OCI are now preparing a follow-on paper, in a question-and-answer format, which expands on the nature of the specific economic benefits the Soviets might expect from US trade.

3. Secondly, the paper concludes that "Moscow could benefit substantially...if it is able to acquire key military-related technology under the umbrella of detente". This constitutes a warning to US decision-makers that care must be taken in relaxing export controls.

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The technology at issue is not the kind that supports the Kama Plant or a new oil pipeline to the Far East. Better trucks and POL distribution are not the kinds of technology that are of great military concern. But the benefits of certain high technology sectors of the West like computers and advanced electronics might well make a substantial difference in the time and costs involved in the Soviet acquisition of military capabilities. Although the paper raises this issue, it does not examine in detail the specific areas of technology where this may be true. In this respect the criticism you raise is valid.

4. What is needed is a direct attack on the question of military-related technology with emphasis on the high technology products and production know-how that are especially important for strategic military programs. Such a study should be undertaken by the S&T organizations in the intelligence community. I am sending a copy of this memorandum to the DDS&T with the suggestion that he organize such a study, perhaps under the aegis of the Scientific Intelligence Committee of USIB perhaps with participation from ISA and DDR&E. The results of such a study would be very useful in the review of the COCOM list which is scheduled for later this year.

5. Directly related to this problem of the export of technology is the problem of the informal access to technology which the Soviets are getting through visits and discussions with US scientists and industrial firms. This kind of access has increased markedly under the detente atmosphere and is very difficult to control. As you know, this problem is being addressed [redacted]

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[redacted]

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EDWARD W. PROCTOR
Deputy Director for Intelligence

cc: DDCI
D/DCI/IC
D/DCI/NIO
DDS&T
DDO
D/OER

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MEMORANDUM FOR: Messrs. Proctor/Walsh

The DCI buys your comment on the criticism of the paper on Soviet economic benefits from detente. He would like a "talking paper" prepared for the June PFIAB session. Do you want to lay this on Ernst?

Brent

29 Apr 74

(DATE)

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LVL JSC

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Routing Slip

TO:

		ACTION	INFO.			ACTION	INFO.
1	DCI			11	LC		
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6	DDM&S			16	Ex/Sec		
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9	D/DCI/NIO			19			
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SUSPENSE _____

Date _____

Remarks:

Good - Can you
prepare a talking
paper for me for
June PFIA B? -

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10 April 1974

DDI-159274

MEMORANDUM FOR: Deputy Director for Intelligence

INFO : Deputy Director of Central Intelligence
Deputy to the DCI for the Intelligence
Community
Deputy to the DCI for National Intelligence
Officers

SUBJECT : Soviet Economic and Technological Benefits
from Detente

1. I had some free criticism on this paper from certain outside readers, which I will share with you. The basic comment was that the fundamental line of the paper, to the effect that U. S. technology is not apt to produce major impact on the Soviet economy, was thought to be unduly soporific in its impact on possible U. S. efforts to restrain the leakage of military-related technology which the report itself notes could be of value to the Soviets. There may be some political position involved in this criticism, but I thought I would share it with you.

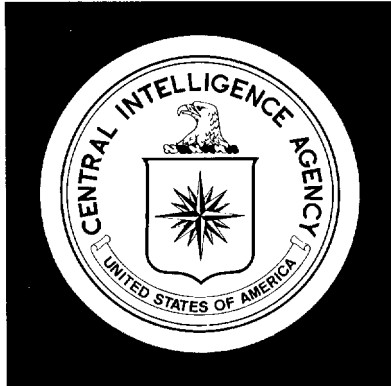
2. I think the basic theme of the report is accurate, and certainly its subject matter was specifically the impact of Soviet economic and technological benefits rather than the military benefits. We certainly have no doubts as to the accuracy of our judgment in this regard, either. At the same time, perhaps the military-related point comes in as a bit too much of an afterthought in view of its significance in U.S.-Soviet relations and the balance of power. Certainly let us not rewrite all our papers into scare papers, and let us try to give an accurate reflection of the problems we face rather than merely crying Wolf, Wolf. At the same time, I think there is some justice in the contention that the intelligence community exists primarily for its contribution to the national security and welfare. Thus our evaluations of foreign situations should give special attention to how they might impact on the U. S., in order to increase their relevancy to our decision-making processes.

W. E. Colby

W. E. Colby
Director

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Intelligence Report

Soviet Economic and Technological Benefits from Detente

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February 1974

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February 1974



Soviet Economic and Technological Benefits from Detente

US-Soviet detente has already brought a succession of economic and technological benefits to the USSR: grain to offset a crop failure, access to technology and equipment previously denied, and long-term credits to finance imports. If detente continues, these gains will accumulate. Nevertheless, overall Soviet economic growth is unlikely to be affected appreciably. Machinery imports from the United States will be small relative to total Soviet investment, and the USSR will continue to have problems in assimilating new technology. The USSR, moreover, has alternative sources of goods and technology if US-Soviet relations sour. Moscow could benefit substantially, however, if it is able to acquire key military-related technology under the umbrella of detente.

The size and terms of the grain purchases from the United States undoubtedly were influenced by the detente atmosphere. The prices paid for the grain were favorable, and Commodity Credit Corporation credits helped the USSR at a time when it was incurring its largest hard currency deficit in history. The US-Soviet maritime agreement also saved the USSR hard currency, as the USSR was able to move several million metric tons of grain on its own bottoms rather than on third-country ships.

Under detente, export controls were relaxed, and some highly prized US equipment and technology became available to the USSR for the first time. Third-generation computers and components and equipment for their manufacture were high on the Soviet shopping list. If science and technology agreements just signed with US computer firms are implemented, Moscow could modernize its computer industry and thus boost productivity in both military and civilian industry. If negotiations for advanced semiconductor production are successful, the Soviets also could be helped in developing complex electronics systems and instrumentation for advanced weapons.

Heavy industry has also received technological aid from the United States. For the Kama truck complex, the Soviets have been able to buy US equipment and technology for the most advanced foundry in the world as well as other equipment not available elsewhere. US technology probably can also help to alleviate the many serious problems confronting Soviet oil and gas industries, particularly exploration and drilling in permafrost and offshore.

Note: Comments and queries regarding this report are welcomed. They may be directed to Office of Economic Research,

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To a substantial degree, these machinery purchases -- like the grain imports -- have been facilitated by US long-term credits, both Eximbank and private. The terms of the Eximbank credits are comparable with or better than those offered in Western Europe and Japan, contributing to the already-existing world competition in promoting exports to the USSR.

US-Soviet trade in technology still has a large potential for growth. Cooperative ventures with US companies for the development of Soviet resources offer important advantages to the USSR. US companies are able to provide the USSR with advanced equipment, technology, and know-how to carry out the large internal development projects currently scheduled. Equally important, the Soviets need to tap US financial markets for government-backed credits if the massive Soviet imports needed for such projects are to be financed at reasonable interest rates.

So far in the detente period, the USSR has obtained US technology mainly through the trade channel. At the same time, however, a network of officially sponsored government-to-government bilateral agreements has been built up which could provide the Soviet economy with a good deal of US technology on an exchange basis. The US-USSR Science and Technology Agreement has led to the conclusion of more than 20 agreements between Soviet agencies and private firms. Most of the agreements call for general cooperation, joint research and development, and exchanges of delegations, information, processes, know-how, and licenses. Most agreements are also in high-technology industries of prime interest to the USSR such as electronics, chemicals, energy, and construction.

The growing imports of machinery and equipment together with cooperative ventures and bilateral agreements will transfer a substantial amount of Western technology to the USSR -- whether in the form of informal (and sometimes inadvertent) disclosure of know-how, exchanges of technical data, or finished products. But the ultimate economic effect of technological transfer through either machinery imports or informal contacts and bilateral exchanges depends on how rapidly the technology is assimilated. Soviet R&D and economic administration have been weakest in carrying technology from research through the development and testing stages into production. Many of the reforms in economic administration, science, and education in the past decade attempted to deal with just this problem, but the reforms seem to have petered out. The Soviet economy must do better in this area if imports of US technology are to have a substantial effect.

Other factors will also reduce the impact of US-Soviet trade and technological relations on the USSR. First of all, US leverage is limited because the USSR can go elsewhere for credits and roughly equivalent machinery and technology, except in a few sectors or for a few giant projects. Second, the scale of such relations -- although increasing -- will remain small relative to total production or trade. For example, imported US equipment will be equal to no more than 1% of the total value of equipment scheduled to be installed in Soviet industry in 1971-75.

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The effect on military capabilities is another matter. Some US technology could help the Soviets considerably in developing new weapons, especially in modernizing their strategic weapons systems. Although thus far the trade, contacts, and technical agreements associated with two years of detente have not transferred discernible amounts of military technology, the changes in US-Soviet relations under detente have the potential to upgrade Soviet military capabilities. While continuing their efforts to acquire such technology by espionage and theft and by purchase from other countries who evade COCOM controls, the Soviets will attempt to acquire military-related technology directly from the United States by opening up new channels of transfer and widening existing channels. Whether the full potential of transfer is realized depends in part on the care with which US firms, scientists, engineers, and technicians treat the developing contacts. In this regard, the guidelines set and administered by the US Government will be influential in determining private attitudes and decisive in limiting the transfer of military-related technology.

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DISCUSSION

Introduction

1. With the easing of tensions, particularly since the May 1972 Summit, there has been a substantial increase in economic, technical, and scientific contacts and exchanges between the United States and the USSR. Aside from political gains from the detente atmosphere, the USSR hopes for concrete economic and technological benefits -- the acquisition of US goods, technology, and know-how, most of which have been denied to the USSR since the beginning of the cold war.

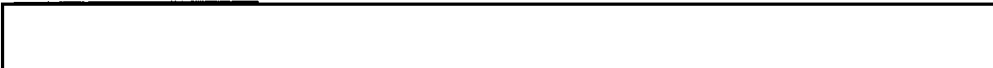
2. In the past two years the decrease in tensions and detente have brought the easing of US and COCOM export controls: Soviet imports from the United States have risen sharply, US Government-backed credits have been made available to the USSR, and numerous bilateral scientific and technical agreements have been concluded. The future also holds out the possibility of large commercial transactions between the two countries and important technology transfers to the USSR. The purpose of this report is to (a) review the nature of US-Soviet contacts and exchanges and (b) assess the economic and technological benefits that the USSR has obtained and may obtain as a result of detente.¹ Because benefits to the United States are not considered, this report does not provide a net assessment of the benefits obtained by the USSR and the United States from detente.

3. The conclusions of this report should be considered to be preliminary because Soviet attempts to obtain US technology under detente are still in an early stage. Little firm evidence is yet available in a number of areas. Even where technology has been acquired by the USSR, often little is known of the impact it has had on the Soviet industry involved. Such factors as the energy crisis and changing attitudes in the United States -- particularly in Congress -- on granting long-term credits to the USSR also may affect these Soviet programs to acquire US and Western technology.

The Impact of Detente on US-Soviet Trade Through 1973

Detente Establishes Preconditions for Greater Trade

4. The US-Soviet negotiations that created the political climate known as detente also led to a marked change in the atmosphere regarding



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US-Soviet trade. The preconditions for a rapid growth in trade were met when controls on US exports were eased, US credits became available, and the shipping impasse was broken.

Export Controls Relaxed

5. One of the principal effects of detente has been the relaxation of export controls. Multilateral (COCOM) controls and US unilateral controls had been eased gradually over a number of years. Recent COCOM List Reviews and the passage of the Export Administration Act of 1969 hastened the process. In 1972, Congress amended the Export Administration Act, retaining the prohibition on exporting strategic items to the Communist countries but narrowing the definition to allow freer export of items that could be used for both military and civilian purposes. The Act required that the US Commodity Control List (CCL) items not controlled under COCOM agreements be eliminated unless their removal from controls would be considered a national security risk. The 550 entries not under COCOM control at the time the review began have been reduced to about 75. The list is now made up largely of computer, electronics, and telecommunication items. US policy positions on the above items and the technology for producing them will be prepared in time for the next COCOM List Review, which probably will begin in late 1974.

6. The change in the US attitude on trade controls has resulted in US shipments to the USSR of items formerly banned and in US approval of exports by other COCOM countries that the United States had opposed earlier. In 1972 a series of US applications to design and sell machinery for the Kama truck plant in the USSR were approved. The removal of export restrictions on this equipment has given the USSR specialized machinery and technology that was not available elsewhere and that the USSR had sought for many years.

7. US policy perhaps has changed most significantly in the computer and related electronic fields. Initial US reaction to the sale of third-generation computers to Eastern Europe and the USSR was negative because of the strategic uses to which these devices could be put and the risk of diversion. The United States, therefore, devised a system of safeguards intended to limit the risk of exporting third-generation computers.² Within this framework, the United States has given its approval to the export of various third-generation computers throughout the Communist area -- including the export to the USSR for "peaceful research" of two ICL 1906s, two ICL 1903s, a CDC 6200, an IBM-360/50, and others. Despite the existing safeguard system and other end-use checks, it

2. Safeguards usually include complete access to machines by the computer firms' engineers and the right to take random "dumps" of memory contents to be examined by computer experts.

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is probably impossible to be certain that these systems are not being diverted to strategic uses. Recent intelligence reports indicate that in the past year at least two third-generation computers were directed from their intended end uses in two East European countries to unknown activities within the Soviet Union.

8. Similarly, during the past few years videotape recorders (VTRs) -- originally developed through US Government research and financing -- have been approved for export in increasing numbers for civilian uses within Communist countries. In December 1973, for the first time in the history of trade controls, 17 highly sophisticated VTRs were approved for export to the USSR. Because of their portability, exporting countries have thus far been unable to place effective controls against the strategic use of these recorders.

9. The United States no longer monopolizes the technology or equipment used in the manufacture of printed circuit boards or semiconductor packaging. As a consequence, several US firms have exerted heavy pressure against US export controls on technology and equipment. COCOM approval has already been granted for the sale to Eastern Europe of production machinery and technology used in the manufacture of integrated circuits. The USSR has yet to purchase any US technology or equipment for the production of advanced semiconductors, but some technical knowledge is being absorbed through increased technical exchanges and greater contact with Western firms. More importantly, technical knowledge and finished devices could be furnished to the USSR from Poland and other East European countries under special agreements for mutual cooperation in semiconductor R&D.

10. Several US firms are now negotiating to sell semiconductor technology to a number of East European countries. One proposed transaction with Poland includes the technology to produce US state-of-the-art integrated circuits (MOS/LSI). Polish acquisition of this technology would make it possible for the USSR to acquire this knowledge and could significantly enhance its production capabilities over the long term, particularly in areas of strategic concern.

Offer of US Credits

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12. By the end of 1972, in sharp contrast to previous years, more than \$800 million in US short-term, medium-term, and long-term credit had been made available to the USSR. Toward the end of 1973 this total grew to roughly \$1,400 million, most of which is associated with low-interest US Government-backed credits. They include the following:

- Short-term bank credit outstanding as of 1 November 1973 of \$49 million, compared with less than \$5 million prior to 1972;
- Short-term non-bank claims outstanding as of 1 July 1973 of \$73 million, compared with less than \$5 million prior to 1972;
- Long-term bank credits outstanding as of 1 November 1973 of \$122 million; prior to 1972, private banks extended only short-term credits to the USSR;
- Three-year CCC line of credit of \$500 million; CCC credits were not previously available to the USSR;
- \$336 million in potential direct Eximbank long-term credits, including authorizations for \$158 million and preliminary commitments for \$178 million in direct credits (as of mid-January 1974); Eximbank financing was not previously available for US machinery and equipment exports to the USSR;
- \$336 million in potential long-term credits from private banks to match Eximbank participation; such financing previously was precluded by the absence of Eximbank participation.

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13. The decision to open the Eximbank window and the provision of CCC credits signaled the beginning of a new era in US-Soviet economic relations and created an aura of excitement that attracted large numbers of US bankers and financiers eager to enter into or expand financial relations with the USSR. This development has greatly enhanced the USSR's ability to pick and choose among suppliers of credit, thereby enabling the USSR to extract credit concessions from the successful "bidders." For example, all private US banks have so far waived the Eximbank insurance on their export credits to the USSR, thereby reducing the USSR's financing costs by one-half percentage point. The large, multi-billion dollar liquefied natural gas (LNG) projects and other US-Soviet projects now under consideration envision expanded Eximbank participation as well as the mobilization of large amounts of private funds on a long-term basis. The availability of these huge sums to finance Soviet imports will depend on continued detente and on Eximbank lending limitations.

US-Soviet Maritime Agreement

14. The conclusion of a US-Soviet Maritime Agreement in 1972 was a third factor helping to promote trade. The agreement led to major cutbacks in the US port security program (making it easier for Soviet ships to visit US ports and increasing the number of US ports open to such visits) and to withdrawal of a labor union's threat to boycott Soviet ships.⁴ Soviet cargo liners and tramp vessels can now participate freely in the movement of US-Soviet trade (moved entirely on third-flag ships through 1968) and in the movement of US trade with other countries.

15. The USSR stands to save considerable hard currency by participating in the movement of its imports from the United States. For example, by using Soviet vessels in moving more than 3 million metric tons of US grain, the USSR saved at least \$40 million in hard currency, and prospects for future earnings are good. It also stands to earn hard currency by carrying Soviet exports to the United States and cargoes moving in US trade with Europe and Japan. The USSR now has cargo lines linking the US West Coast with Japan and other Far Eastern countries and linking Great Lakes, East Coast, and Gulf ports with Europe. In the tramp field (largely bulk cargo), Soviet ships under charter have made only a few cross-trade voyages between the United States and third countries thus far.

4. US and Soviet merchant ships stopped calling at each others ports in 1950. Soviet ships were excluded from US ports both by the threat of a boycott by stevedores of the International Longshoremen's Association (ILA) at Great Lakes, East Coast, and Gulf ports and by the USSR's refusal to put up with the inconvenience of US port security regulations applying to Communist ships. In mid-1969 the USSR overcame its unwillingness to operate ships under the US port security system and began a cargo liner service between Japan and US West Coast ports, where the ILA has no jurisdiction. For most ports the Maritime Agreement reduces the number of days' notice of arrival and increases the number of ports-of-call from 6 to more than 40.

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When the demands of the grain lift diminish, however, there should be more opportunities for such voyages, especially for ships returning to Europe after delivering Soviet cargoes to Cuba.

Soviet Imports from the United States Soar

16. The relaxation of export controls, the provision of trade credits, and the shipping agreement have had a dramatic impact on US-Soviet trade (see the chart). The USSR's imports from the United States increased much faster than its sales to the United States. Purchases of machinery and equipment and grain accounted for much of the growth in Soviet imports; Soviet sales to the United States continue to consist principally of platinum group metals, diamonds, and chrome ore, but fuel oil became an important commodity in 1973 as well.⁵ As a result of the sharp upswing in the volume of trade, the United States became the USSR's leading Western trade partner in 1973.

Machinery and Equipment

17. In the last two years the USSR has contracted for about \$800 million in US machinery and equipment (see Tables 1 and 2). This compares with more than \$200 million in 1971 and some \$30 million annually in previous years. The US share of Soviet orders also has risen since 1970 (see Table 1).

18. The machinery and equipment that the USSR has sought especially in the United States include truck-manufacturing equipment, computers, and certain other electronics equipment, as well as various types of oil and gas field equipment. These are areas in which US technology excels. Most of the other equipment and technology ordered from the United States is available in a number of other countries, however.

19. For the Kama truck plant, the USSR contracted with Swindell Dressler to design and coordinate the procurement of machinery for the most advanced automated foundry complex in the world. Other Kama purchases include gear-making machinery, automated transfer machinery, and computer-controlled conveyor systems, all of which, for reasons of durability, precision, or productivity, are technologically superior to systems available in Western Europe.

20. Kama-built trucks will provide the USSR with badly needed transport for use in agriculture, relieve overtaxed railroads of some of the burden of freight hauling, and expand the supply of off-highway trucks

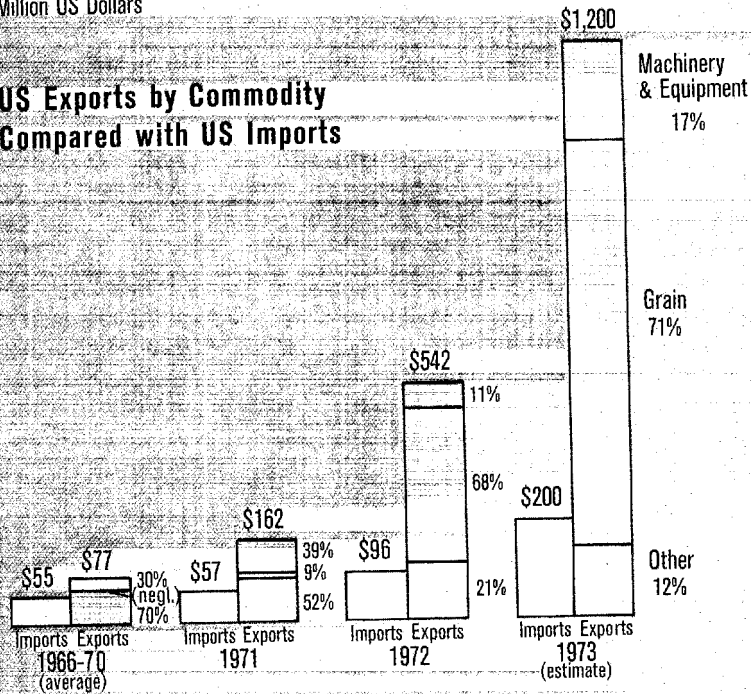
5. 1973 data are for January-September only.

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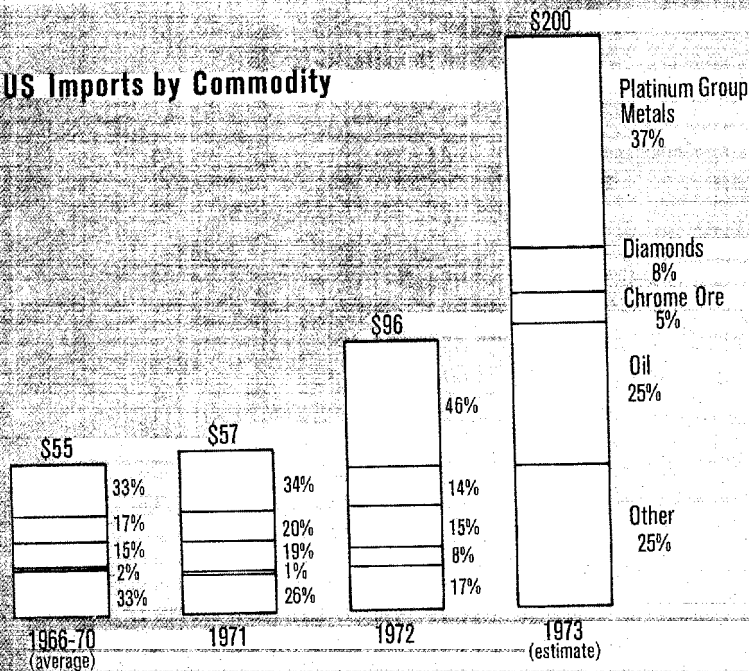
US Trade with the USSR

Million US Dollars

US Exports by Commodity Compared with US Imports



US Imports by Commodity



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Table 1

USSR: Machinery and Equipment Orders¹

Million US \$				
From	Average 1966-70	1971	1972	1973 ²
Total	620	840	1,580	2,530
United States	30	240	345	435
Italy	160	65	170	625
West Germany	35	145	370	425
France	125	75	340	395
Japan	100	140	135	155
Sweden	30	10	15	145
United Kingdom	90	120	75	135
Other	50	45	130	215

1. Rounded to nearest \$5 million.

2. Preliminary.

Table 2

USSR: Machinery and Equipment Orders
from the United States

Million US \$		
Category	1972	1973
Total	345	435
Chemicals	10	45
Oil refining and pipelaying	17	68
Metalworking and metallurgy	5	56
Motor vehicle manufacturing	136	182
Mining and construction	121	4
Electronics	15	22
Other	41	58

for use in the many roadless areas in the USSR. The Soviet military establishment will benefit by retaining for its own use all-wheel drive trucks that, because of persistent short supply, are often preempted for use in agriculture, industry, and construction.

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21. The USSR has been seeking US technology across the whole spectrum of computer manufacture, including central processing units, peripherals, components (memories and integrated circuits), and computerized test equipment. The Soviets also want to conclude multimillion dollar, multicomputer system deals that include software and training of specialists. For example, they would like to contract for a regional air traffic control system and a system for production and inventory control at the Kama truck plant. Most of this equipment and technology is still embargoed under US and COCOM trade controls, although four large US systems have been sold to the USSR under the COCOM exceptions procedure. Although the benefits to the USSR from US computers already acquired probably are not large, the USSR stands to gain substantially if the large US systems now being negotiated are sold. These sales would include training for specialists in software maintenance and systems analysis, areas in which the USSR is particularly weak. Such training would make possible the creation of a key cadre qualified to train, in turn, large numbers of other specialists. Training in the operation and maintenance of large computer systems is directly applicable to industrial as well as complex military problems.

22. Some US firms in the semiconductor industry also have viewed detente as an opportunity to expand sales. The USSR has not yet acquired US equipment or technology for the production of integrated circuits or other advanced semiconductors because these items are still embargoed. As a result, the direct benefits from detente in this area have been restricted to the random bits of production know-how that may have been acquired through the technical exchanges program and through Soviet contacts with US businessmen and scientists. Several US firms, however, are now negotiating with the USSR for the sale of complete facilities for the production of advanced types of semiconductors. Soviet access to a reliable supply of these devices could speed Soviet development of complex electronic systems and instrumentation for advanced weapons.

23. To help overcome the many serious problems confronting its petroleum industry, the USSR has been especially active in negotiations for US petroleum equipment and technology. Soviet problems include exploring and drilling for oil and gas in permafrost and offshore, maintaining production in older fields, building pipelines for transport of oil and gas, and improving the quality of refined products. A recent exposition in Moscow, at which US firms displayed the latest in petroleum equipment and technology, aroused considerable interest among Soviet petroleum officials and resulted in additional Soviet orders and purchases. Some of the equipment -- down-hole submersible pumps, drill collars, and drill bits -- that the USSR has ordered in large quantities are in short supply in the United States. Sales to the USSR of such equipment resulted in delayed deliveries to US petroleum firms.

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24. Over the past 10 to 15 years the Soviet Union has purchased a large volume of chemical equipment from the West. American firms, however, accounted for only a negligible share of the Soviet orders. The United States usually supplied only technical data. Since detente, and particularly during 1973, the US role in supplying chemical equipment and technology to the USSR has grown. An outstanding example of what may be in store for the future under detente is the 20-year, \$8 billion agreement announced in 1973 by the USSR and Occidental Petroleum Corporation. This agreement calls for an exchange of fertilizer materials and the construction of eight ammonia and two urea plants in the USSR. The Soviet Union is to receive one million tons of concentrated phosphoric acid starting in 1978 in exchange for Soviet-produced ammonia, urea, and potash. The phosphoric acid should help to raise Soviet agricultural yields. In addition to increasing yields, phosphate fertilizers can hasten the ripening of grain, an important consideration in regions that have a short growing season.

25. The ammonia plants will each have an annual production capacity of 500,000 tons; the largest Soviet-manufactured ammonia units in operation have annual capacities of 200,000 tons or less. The ammonia plants going to the USSR probably will incorporate technology belonging to M.W. Kellogg Company. Kellogg is the world's most experienced firm in engineering and erecting large single-train ammonia plants that use centrifugal compressors and minimize unit energy requirements.

Soviet Grain Purchases

26. During 1972 and 1973 the Soviets bought 37 million tons of grain from the West, including about 25 million tons from the United States. Although the decision to buy US grain was motivated by Soviet internal policy considerations, the exceptional size and the favorable terms of the purchases from the United States no doubt were influenced by the detente atmosphere. The extension of \$500 million in CCC credits to Moscow was especially important.

27. Soviet grain output is subject to extreme fluctuations. In 1972, Soviet grain output fell by about 10% below the 1971 level as a result of unusually poor weather. Without imports of Western grain, considerable belt-tightening would have been necessary because grain and potatoes form the core of the Soviet diet. Moreover, the drop in grain production came at a time when the demand for grain as livestock feed was increasing rapidly. A Brezhnev-sponsored program begun in 1965 to provide more meat and other quality foods had boosted the use of grain for livestock feed. If Western grain had not been available, the Brezhnev program would have had to be interrupted and perhaps abandoned. This would have been extremely unpalatable to the leadership, which had pledged itself to better the lot of the consumer.

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28. The success of the Soviet livestock program seems to depend on continued access to Western grain. The Soviets could require grain imports of 15 million tons annually through the rest of the 1970s, assuming an average increase in grain output under normal weather conditions. Soviet purchases this year illustrate their continued dependence on Western grain. Despite a record net grain harvest of 170 million tons -- compared with the previous high of 150 million tons in 1970 -- the Soviets contracted for the delivery of 12 million tons of grain in fiscal year 1974. Although this is only one-half the amount delivered in the previous fiscal year, it will cost them two-thirds as much foreign exchange because of high grain prices.

29. Because the United States has such a large share of world grain trade, a large Soviet grain requirement will almost have to include substantial purchases from the United States. A number of prominent Soviet trade and agricultural officials have admitted to US visitors that the USSR will require long-term imports of food and feed grains from the United States even if the USSR has good harvests.

Outlook for Future Soviet Gains from Trade with the United States

30. The continued growth of Soviet imports from the United States depends on a favorable climate for trade. Whether trade flourishes depends in part on Congressional reception of the US-USSR trade agreement. If detente seems uncertain, the credits necessary for an expansion of trade may dry up. Equally as decisive for trade will be the attitude of American business toward the large cooperative ventures that the Soviets are counting on to support their growing acquisitions of US equipment and technology. Such ventures are likely to materialize only in an atmosphere of confidence.

Trade Agreement and MFN Tariff Treatment

31. If Congress does not approve most-favored-nation (MFN) treatment and ratify the US-USSR trade agreement signed in 1972, US-Soviet economic relations will no doubt be dampened. Ratification of the agreement on the other hand will do little more than provide formal US approval of the upward trend in economic relations between the two countries.

32. The lack of MFN treatment in the past has had a negligible effect on Soviet exports to the United States. With few exceptions, Soviet exports to the United States entered either duty free or suffered little or no discrimination when subject to the full 1930 tariff rate. This is largely because Soviet exports to the United States (and to other advanced market economies) have been dominated by raw materials and semimanufactures,

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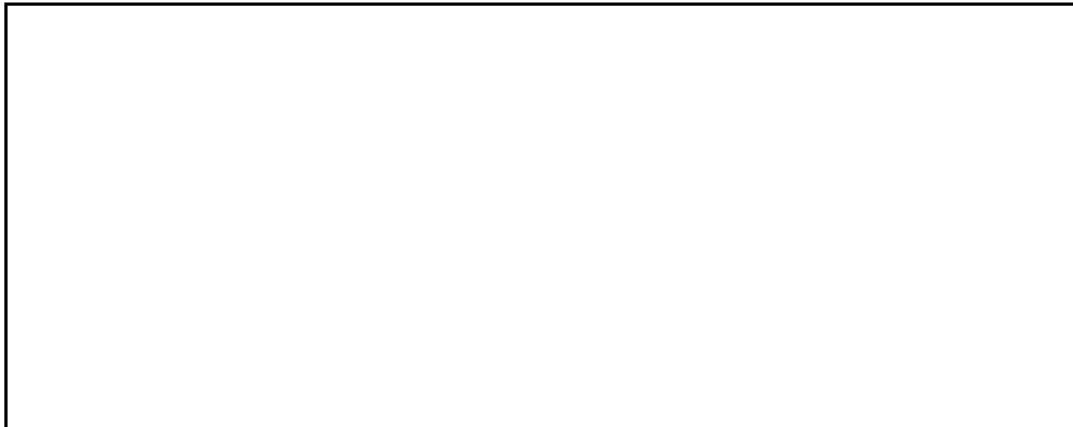
commodities generally at the low end of the spectrum of tariff discrimination. Currently, the USSR could conceivably increase exports of some commodities such as plywood, particle board, vodka, dressed furs, sheet glass, and the like if it had MFN status. But, in the short run, the additional foreign exchange earnings would be small.

33. Until the recent oil price increases, Soviet oil exports to the United States faced discrimination because oil is subject to the full rate, then equivalent to about 10% *ad valorem*, compared with roughly 4% or less if the USSR qualified for MFN. Because the duty on oil is specific, at today's higher prices the full rate's *ad valorem* equivalent is only about 3%, compared with an MFN rate of 2% or less -- thus there is no longer any effective discrimination between the two rates. US imports of Soviet oil (mainly fuel oil) in the first nine months of 1973 were valued at nearly \$36 million, compared with about \$7 million in all of 1972.

34. Benefits accruing to the USSR because of MFN might be substantial in the longer term if the USSR is successful in carrying out its current plans to produce manufactured goods designed for export to the United States. The product lines envisioned in this future trade are highly finished consumer-oriented goods that face significant discrimination unless the USSR obtains MFN treatment.

Cooperative Ventures

35. Cooperative ventures with US companies probably offer the best chance for large, continuing growth in US-Soviet trade. The USSR wants US companies to provide advanced equipment, technology, and know-how to implement the large development projects currently being considered. US firms are frequently singled out because in many cases they have the best equipment and technology. Equally important is the Soviet need to tap US financial markets for the huge credits required for the massive Soviet imports needed for such projects.



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USSR with an additional one billion cubic feet of natural gas daily for either domestic use or additional exports.

37. US investment in other Soviet raw material development projects -- Sakhalin offshore deposits and the proposed Tyumen-Nakhodka oil pipeline -- is also being considered. US participation in offshore exploration for natural gas and oil deposits appears particularly desirable to Moscow because of the specialized equipment and large credits involved and the need for US offshore drilling technology. The Tyumen pipeline project, if realized, would generate more hard currency revenue for the Soviets than the two LNG deals combined and has interested some US firms.

38. East Siberian projects such as the Udokan copper deposits and the Yakutsk coal fields are ventures that almost surely must have foreign assistance if they are to be started in the next decade. Besides financing, US participation would provide mining and ore processing equipment, generally superior to Soviet equipment, and US managerial, planning, and engineering skills.

39. The Soviets are also negotiating for the exchange of US industrial processes and technology for Soviet metals and minerals. The best example is a package of proposals put together by a group of US firms, which will provide a variety of services, including specialists for construction, preliminary and planning engineering, assistance in procurement of equipment, advisory construction management, training of USSR operators, start-up assistance, and royalty-free licenses to use the processes. In exchange, the US participants will buy or accept as compensation for services a number of metallurgical and other manufactured products.

39. The large cooperative ventures discussed above would provide the USSR with significant inputs of technology and equipment and would enable it to repay the credits with products. In terms of technology transfer, the ventures differ little from direct purchases of turnkey projects because they provide for nothing in the way of technology transfer or Western assistance after the venture begins to produce.⁶ The Soviets, however, are trying to elicit US commercial participation in cooperative ventures that offer continuing technology transfer and Western assistance or that otherwise maintain a vested US interest in the operation of the enterprise.

40. In discussions with some US oil companies for the exploration of offshore oil deposits, for example, Soviet proposals have gone beyond simple commodity pay-back arrangements. To interest US firms, which are often loath to part with advanced technology and know-how for a fixed

6. Additional US assistance would be required, however, if product quality is not up to standard.

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Soviet payment, the USSR has indicated a willingness to establish jointly owned firms. Under such a plan, US firms would receive a fixed percentage of all crude oil discovered in return for their exploration expertise and equipment.⁷ In addition to a major share of crude oil output, the USSR would acquire US equipment and access to drilling technology for the life of the agreement.

41. The USSR also has considered offering equity participation, which some US firms want if they are to make particularly valuable technology and equipment available to the USSR. After proposing that a US firm provide a plant under such terms, the Soviets backed off, however. The two parties now are talking about a long-term technology sale by the US company in return for periodic Soviet payments and an agreement not to market the output outside the USSR.

42. In still other cases, the USSR has sought to enter into cooperative agreements that would increase sales of their manufactured goods in the West. The Soviets have held discussions with several US firms on the marketing of Soviet products whereby the US firm would, where necessary, modify Soviet equipment to make it more acceptable to Western requirements. Raymond Loewy, a leading industrial designer, has signed a cooperative agreement with the Soviets that calls for the US firm to assist in the design of automobiles, hydrofoils, and watches. The agreement, which initially has a life of 2-1/2 years, will provide the USSR with production and marketing expertise useful in selling manufactured goods on Western markets.

Soviet Acquisition of US Technology Outside the Trade Channel

43. The USSR has acquired foreign technology mainly by purchasing machinery and equipment. However, other channels of transfer have included the acquisition of technical data, attendance at international meetings, visits to Western firms, and formal agreements for collaboration in research and the exchange of scientific and technical information. Under detente, Moscow has been pushing hard to tap all possible sources of US technology.

7. The Soviets may be reassessing this position. They are now suggesting that the oil repayment be based on current world prices, making it a less attractive proposition to US firms.

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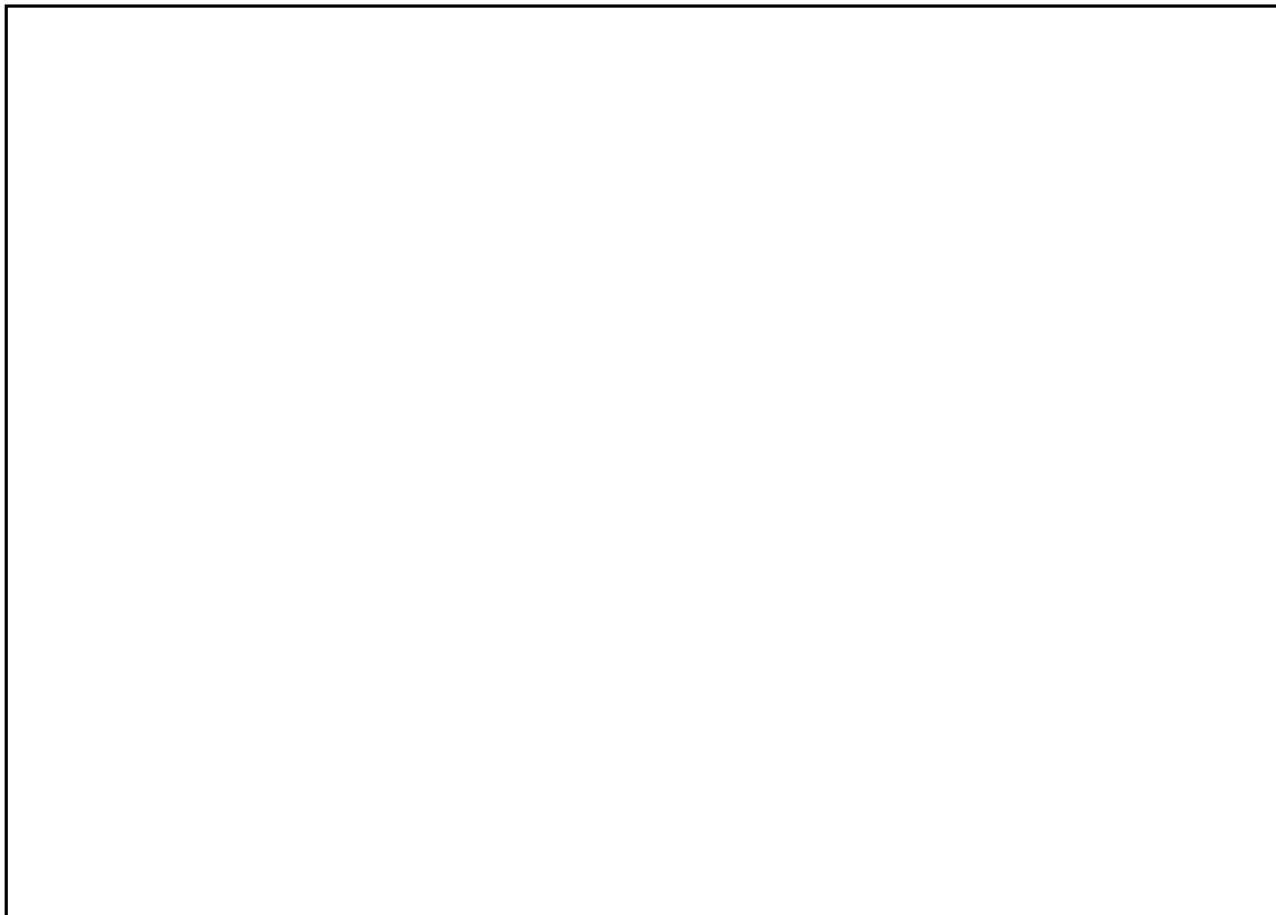
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*Bilateral Scientific and Technological Cooperation
Before the May 1972 Summit*

50. Bilateral cooperation between the United States and the USSR in science and technology (S&T) had its origin in a series of agreements signed in 1958 under the US-Soviet exchange program. These exchanges were arranged and monitored by the respective governments. The members of the delegations, the topics, and the itineraries were approved in advance, and the exchanges were balanced in terms of numbers and areas of access. Data flow between the United States and USSR also took place during this period at international meetings.

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52. The benefits to the USSR of the bilateral exchange program with the United States were probably modest, but the USSR won greater recognition for its science program by portraying itself as the equal of the United States in the "big science" areas of space, nuclear science and technology, oceanography, and the like. While the USSR acquired some scientific data, it received little know-how of appreciable benefit to its civilian economy or its military establishment.

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Government-to-Government Agreements Under Detente

54. At the May 1972 Summit the United States and USSR signed four major agreements for bilateral cooperation -- agreements covering S&T, exploration and use of outer space for peaceful purposes, environmental protection, and medical science and public health. At the June 1973 Summit, five additional agreements for bilateral cooperation were signed. Three focused on S&T -- studies of the world oceans, transportation, and peaceful uses of atomic energy.

55. In some respects these agreements simply strengthened the administrative mechanism, not the substance, of cooperative efforts already under way -- such as those in oceanography, atmospheric modeling, earthquake prediction, and nuclear energy. Nevertheless, these agreements embodied some significant new features, especially as viewed by the Soviets. First, the two governments gave a clear endorsement to bilateral cooperation between the two countries. The language of Articles 3 and 4 of the S&T

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agreement was clearly of particular significance to the Soviets. Article 3 includes an explicit recitation of the various mechanisms for collaboration, and Article 4 calls for each party to encourage and facilitate contacts and cooperation.

56. Since the signing of the first series of agreements in May 1972, the Soviets have moved vigorously toward initiating specific collaborative work projects with US scientists in a very wide range of subjects, including joint manned space flight, non-nuclear energy R&D, chemical catalysis, microbiological synthesis, and the application of computers to management. In general, the Soviets have selected their most capable scientists and their best institutes to participate in these bilateral programs. In addition, they have seen to it that problems of longstanding concern to them have been included in the overall program. In contrast to the pre-1972 exchange program, which tended to stress basic scientific research, the current program is oriented more toward projects offering greater potential impact over a shorter period of time -- projects where additional work could lead fairly quickly to improved products and stepped-up productivity for the USSR. For example, joint US-USSR research on catalytic reactor modeling and on the design and operation of thermal and hydroelectric power stations, if pursued along the lines the Soviets probably envision, is likely to benefit the USSR more extensively and within a shorter period than the more scholarly work in pure mathematics or theoretical physics carried out under prior agreements.

57. Soviet activities during this year and one-half period clearly continue the multi-pronged approach to obtaining Western know-how in key technological areas of the previous decade. Computer technology is a good illustration. Under the S&T agreement, the Soviets pushed for cooperation in the application of computers to management, and at least one aspect of many of the other subjects for cooperation -- magnetohydrodynamics (MHD), S&T information processing, metrology and standardization, and water resource systems -- involves the use of computers. Moreover, the Soviets have signed agreements for joint research with the Control Data Corporation (CDC) and the Hewlett-Packard Corporation.

58. Furthermore, the overall bilateral program appears to offer opportunity for the transfer of US technology to the USSR in areas not explicitly identified for cooperation. A modest amount of advanced US semiconductor technology, for example, went to the USSR in the form of medical equipment under the bilateral agreement on medical science and public health, and other technology conceivably could be transferred in small amounts under other agreements with little notice being taken.

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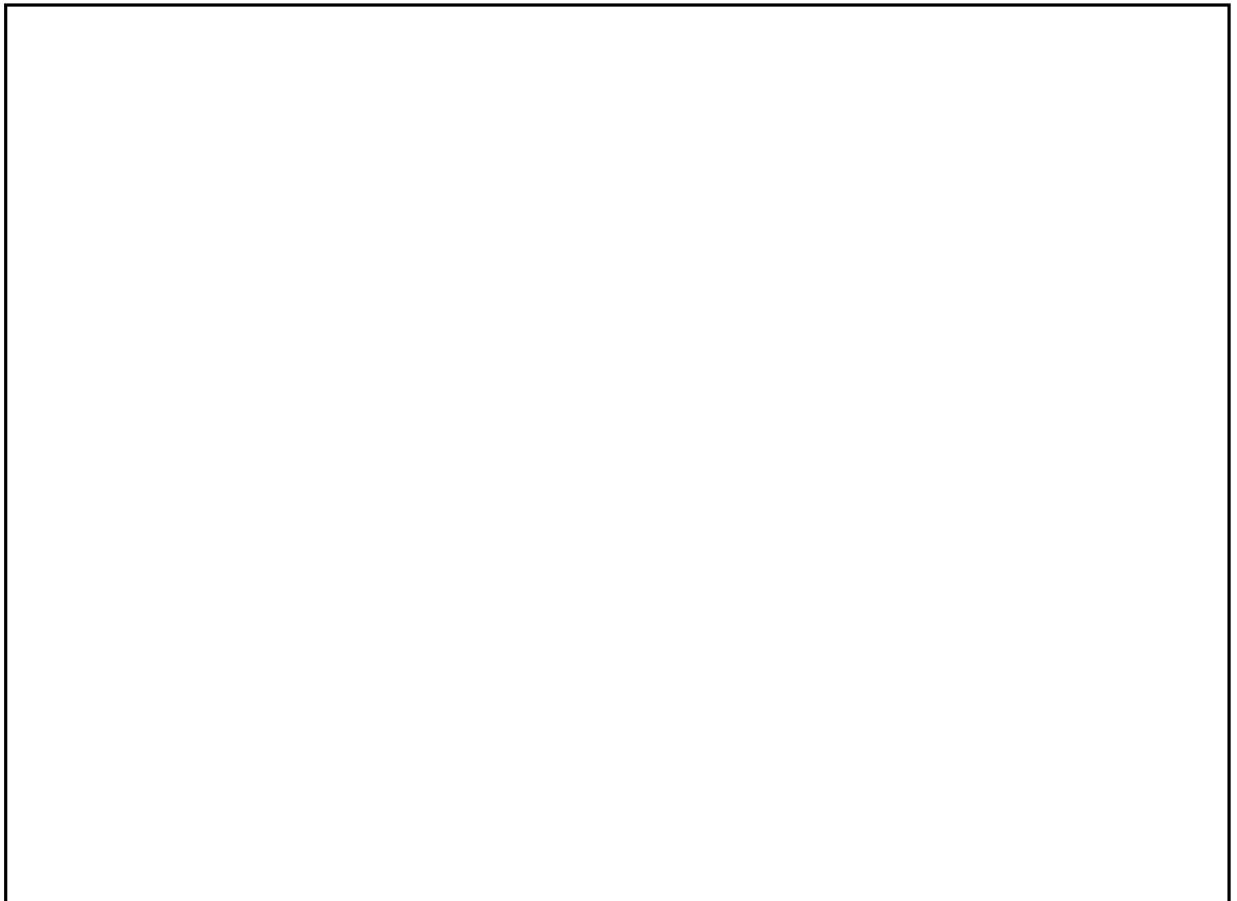
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*Potential Benefits to the USSR from Bilateral
Scientific and Technological Cooperation*

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70. Another less tangible but potential benefit to the USSR is a marked enhancement of their international prestige in S&T. The gain is illustrated very well by the joint Apollo-Soyuz Test Project (ASTP), which will support the illusion that, despite a lack of manned lunar expeditions, the USSR is on a scientific and technological par with the United States in manned space flights. In fact, however, most of the technical and managerial responsibility is being assumed by the United States. The ASTP also offers the possibility of additional benefits to the USSR, such as the closest look to date at US scientific, technical, and managerial know-how as brought to bear on a major undertaking. Thus the USSR is taking a minimum risk and expecting a maximum gain. Potential benefits in prestige also exist in the geophysical sciences such as climatology and earthquake prediction where some of the Soviets' creditable work will receive greater visibility and thus gain more acclaim worldwide.

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The Speed of Assimilation

89. Because the quantity of embodied technology transferred from the United States will be limited, greater weight attaches to its qualitative impact. The imported machinery will be more productive than the machinery available domestically, but clearly the contribution of US machinery will be limited unless it can be duplicated and adapted on a wide scale. Similarly, the technology acquired outside the trade channel through direct and indirect contacts must be translated into blueprints and brought to series production. Thus the efficiency of assimilation will be critical in determining the effect of US technology on Soviet economic performance. But, there is no indication that the USSR's record with respect to assimilating foreign technology will improve markedly in either the short term or the medium term.

The Allocation of the Detente Dividend

90. The technology transferred to the USSR will permit larger output with the same amount of resources or, perhaps, the same output with fewer resources. In either case, the additional resources present the leadership with a policy choice – how to allocate this dividend among consumption, investment, and defense. Some assessments of the effect of technology transfer on economic growth or military spending assume that the freed resources are allocated all to investment or to defense. While the Soviet leaders are continually faced with the problem of balancing defense needs against their economic objectives, defense has traditionally been afforded the highest priority claim on the resources of the Soviet economy.



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Potential Benefits

95. Two years of detente marked by traditional Soviet opportunism, however, have laid the groundwork for the possible transfer of important military-related technology to the USSR.

96. The cooperation agreements between American firms and the USSR have opened up a new channel for the potential transfer to the USSR of technology having ultimate military applications. Many of these firms produce military or military-related equipment. This new channel, therefore, could provide the USSR with valuable help through informal contacts, the supply of finished equipment, or cooperation in R&D. Soviet initiatives to US aircraft, computer, and metallurgical companies are of special interest in this connection.

97. The flow of technology through existing channels -- trade, technical exchanges, and the like -- could also expand to encompass military-related technology. Under detente, the attitude of US firms doing business with the Soviet Union has changed. They are now requesting

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government approval for the sale of production technologies that they would not have considered supplying to the USSR a few years ago. Some Soviet acquisitions that are not now banned by export controls, moreover, could be adapted in time for military purposes. Quality control procedures and the employment of computers in managing complex development projects are examples.

98. Finally, detente is likely to improve Soviet prospects for obtaining military-related technology by lowering barriers in third countries. To the degree that the United States relaxes its controls on the export of strategic goods, other countries will almost certainly let their standards fall to even lower levels. The COCOM partners of the United States have generally been less strict in applying controls, and they are strong competitors in some of the advanced technologies that the Soviets are seeking.

99. In short, the changes in US-Soviet relations under detente have the potential to upgrade Soviet military capabilities. The flow of technology already touches militarily significant areas in the computer and electronics fields. Whether the full potential is realized depends in part on the care with which US firms, scientists, engineers, and technicians treat the developing contacts. Moreover, the guidelines set and administered by the US Government will be influential in determining private attitudes and decisive in limiting the transfer of military-related technology.

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